



Doctor of Philosophy Thesis in Business Analytics Study Plan (2025)

| Foundation (Semester 1) | Lecture | Credit |
|--|---------|--------|
| QM701: Big Data Applications and Analytics | 3 | 0 |
| QM702: Artificial Intelligence | 3 | 0 |
| QM703: Machine Learning | 3 | 0 |
| General Courses (Semester 2) | | |
| BUS790: Data Science for Business Research | 3 | 3 |
| BUS791: Research Methodologies | 3 | 3 |
| BUS792: Applied Business Analytics | 3 | 3 |
| Advanced Business Analytics courses (Semester 3) | | |
| BUS793: Ethical AI and Governance | 3 | 3 |
| BUS794: Advanced Topics in Optimization and Simulation | 3 | 3 |
| BUS795: Seminar on Contemporary Topics in Business Analytics | 3 | 3 |
| BUS796: Data-Driven Decision Making techniques in Business Analytics | 3 | 3 |
| Thesis proposal (Semester 4) | | |
| BUS797: Thesis proposal in Business Analytics | 6 | 6 |
| Thesis (Semester 5-9) | | |
| MGT798: Doctor of Philosophy Thesis in Management/ MKT798: Doctor of Philosophy Thesis in Marketing/ FIN798: Doctor of Philosophy Thesis in Finance/ SBF798: Doctor of Philosophy Thesis in Islamic Finance/ ACC798: Doctor of Philosophy Thesis in Accounting | 48 | 48 |

Course Descriptions

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|----------------------------|--|----------------------|-------------------------------------|
| Course Code: | QM701 | Course Title: | Big Data Applications and Analytics |
| Course Description: | <p>This course provides in-depth, critical insight into the forefront of big data systems and analytical frameworks, examining advanced technologies, software, and tools essential for understanding the evolving landscape of big data. Topics include the strategic integration of cloud-based solutions, sophisticated data management practices, and the role of big data analytics in complex organizational environments. Students will explore advanced deployment strategies, conduct critical evaluations of big data applications, and engage with unpredictable, complex data challenges. Prior foundational knowledge of data analysis, statistics, and database systems is required.</p> | | |

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| Course Code: | QM702 | Course Title: | Artificial Intelligence |
| Course Description: | <p>This course critically explores foundational and cutting-edge concepts in artificial intelligence (AI) and its transformative applications in business. Focusing on intelligent agent design, expert systems, neural networks, and heuristic techniques, students will apply high-level AI methodologies to complex, unpredictable business challenges. Prior knowledge in programming, basic machine learning, and business process analysis is required. The course emphasizes autonomous research, creative problem-solving, and critical assessment of AI's implications on business strategy, requiring students to innovate and apply knowledge in scenarios that push the boundaries of existing practices.</p> | | |

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| Course Code: | QM703 | Course Title: | Machine Learning |
| Course Description: | <p>This course provides an advanced exploration of machine learning (ML) and deep learning techniques, equipping students with the ability to design, develop, and evaluate ML models within a business context. Emphasis is placed on supervised and unsupervised learning methodologies, including algorithms like Decision Trees, Support Vector Machines, and various clustering techniques. Prior knowledge of statistics, programming, and foundational machine learning concepts is required. Through applied, research-based projects, students will develop expertise in implementing ML strategies in complex, unpredictable environments, autonomously adapting and critically evaluating model performance to support strategic business objectives.</p> | | |

General Courses:

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| Course Code: | BUS790 | Course Title: | Data Science for Business Research |
| Course Description: | <p>This course offers an advanced examination of innovative data science techniques and their transformative applications in business research. Topics include causal inference with machine learning, text analysis, and network analysis. Prior knowledge of statistics, programming, and basic machine learning techniques is required. The course highlights the strategic importance and innovative opportunities arising from integrating novel data sources and advanced analytics to generate actionable insights. Students will apply specialized techniques, critically engage with complex data-driven challenges, and make autonomous, informed judgments in data science applications within business contexts.</p> | | |

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| Course Code: | BUS791 | Course Title: | Research Methodologies |
| Course Description: | <p>This course students an in-depth exploration of quantitative research methodologies and paradigms within the business and social sciences domains. It covers the development of theoretical frameworks, critical evaluation of research designs, and the application of advanced statistical techniques. A strong foundational knowledge of business analytics and quantitative research is required for this course to ensure full engagement with the advanced topics covered. Students will explore diverse research paradigms, actively engage in faculty-led projects, and refine their research skills in real-world business analytics contexts.</p> | | |

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| Course Code: | BU792 | Course Title: | Applied Business Analytics |
| Course Description: | <p>This course provides an in-depth exploration of applied business analytics, focusing on high-level modeling techniques in data mining, machine learning, operations research, and management science. Prerequisite knowledge of statistical modeling, programming, and foundational analytics is essential. Students will engage with sophisticated optimization and data analytics techniques, critically formulating and solving complex, data-intensive problems in a variety of real-world business domains. The course emphasizes autonomous problem-solving and strategic decision-making, equipping students with advanced tools and insights to drive data-driven solutions in unpredictable, challenging contexts.</p> | | |

Advanced Business Analytics Courses:

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| Course Code: | BUS793 | Course Title: | Ethical AI and Governance |
| Course Description: | <p>This course focuses on the ethical, legal, and policy dimensions of Artificial Intelligence (AI), equipping students with the expertise to address the complexities of AI governance in variable, unpredictable, and global contexts. It integrates theoretical knowledge with applied practices, emphasizing the development and adaptation of innovative governance strategies for AI systems. This course requires students to have a foundational understanding of Artificial Intelligence (AI) and research methodologies to engage effectively with its advanced topics. By employing expert-level analytical, problem-solving, and communication skills, participants will emerge as strategic leaders capable of advancing the responsible development and deployment of AI technologies.</p> | | |

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| Course Code: | BUS794 | Course Title: | Advanced Topics in Optimization and Simulation |
| Course Description: | <p>This course explores cutting-edge methodologies and applications in optimization and simulation, focusing on their strategic role in complex decision-making processes. Students will engage with advanced topics such as stochastic optimization, metaheuristic algorithms, and agent-based simulation, addressing challenges in dynamic and uncertain environments. The course requires theoretical foundations, computational techniques, and practical applications for Business. Through hands-on projects, case studies, and simulations, students will develop critical problem-solving skills, leveraging optimization and simulation tools to design innovative solutions to real-world problems.</p> | | |

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| Course Code: | BUS795 | Course Title: | Seminar on Contemporary Topics in Business Analytics |
| Course Description: | <p>This advanced seminar engages students in a rigorous exploration of contemporary topics in business analytics, focusing on specialized theoretical frameworks and quantitative methods in Management, Marketing, Finance, Islamic Finance, and Accounting. Students will critically analyze and apply data-driven decision-making methodologies, developing advanced expertise in both quantitative and qualitative tools. The course fosters collaborative learning, empowering students to address industry-specific challenges, contribute innovative solutions, and influence the future direction of research in their specialized sectors. Based on previous knowledge on machine learning techniques, students will refine their academic and professional identities, preparing them to make substantial contributions to business analytics scholarship.</p> | | |

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| Course Code: | BUS796 | Course Title: | Data-Driven Decision Making techniques in Business Analytics |
| Course Description: | This course empowers business students to transform complex business challenges into researchable questions using advanced data science techniques. The course emphasizes the application of data-driven decision-making techniques in business research, enabling students to analyze and interpret data for evidence-based solutions. Through research-oriented projects, students will refine their analytical skills and investigate the ethical implications of data use in decision-making processes. | | |

Proposal and Thesis Courses

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| Course Code: | BUS797 | Course Title: | Thesis proposal in Business Analytics |
| Course Description: | This course focuses on the principles of academic writing and the development of a doctoral thesis. Students will learn how to structure and present research clearly, develop well-defined research questions, and integrate relevant data and analysis. Emphasis is placed on critical thinking, argumentation, and academic rigor. Through workshops and personalized feedback, students will refine their writing process, ensuring their thesis is well-organized, original, and contributes meaningfully to their field. The goal is to prepare students for producing a comprehensive, impactful doctoral thesis. | | |

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| Course Code: | MGT/MKT/ACC/FIN/SBF798 | Course Title: | Doctor of Philosophy Thesis in (Management/Marketing/Accounting/Finance/Islamic Finance) |
| Course Description: | This course represents the culmination of doctoral research and intellectual exploration over two semesters. This course allows students to undertake independent, original, and advanced research under the supervision of experienced faculty. The thesis addresses complex, real-world business analytics problems, contributing to the theoretical and practical advancements of the discipline. By the end of the course, students will exhibit autonomy, scholarly integrity, and mastery in a specific field of business analytics, showcasing their findings through a comprehensive thesis and a successful defense before an academic committee. | | |